misprint

The Veterinary Record.

(Founded by William Hunting, F.R.C.V.S., 1888.)

No. 4. JANUARY 23, 1926. Vol. 6.

Veterinary Biological Products—Their Standardisation and Application.*

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This paper was written for presentation to the North of England Division of the N.V.M.A., because, in choosing a subject on which to write, we have been guided by the facts that we could best give information on animal diseases which we have been investigating recently, and that all veterinary practitioners might not have full knowledge of the degree of accuracy with which veterinary biological products can be standardised. Our intention is to deal especially with biological products in use for the prevention, cure or diagnosis of blackleg in cattle and sheep, braxy in sheep, *B. bronchisepticus* infection in dogs, swine erysipelas, leptospiral canine jaundice, tetanus and tuberculosis. On a given batch many tests are usually made; we show only typical ones taken from our records.

Blackleg in Cattle and Sheep.

Because it has been shown that *Vibrion septique* is found alone or in association with *B. chauvœi* in some cases of clinical blackleg in cattle and sheep, products have been devised which, on subcutaneous injection, will confer immunity against infections of both organisms. This product consists of equal quantities of *B. chauvœi* filtrate which, in our experience, has proved atoxic for all animals even when injected intravenously in large amounts, and a toxin-antitoxin mixture of *Vibrion septique*, which is also atoxic, although *Vibrion septique* toxin alone is highly pathogenic. Many experiments have been done to show that this product does confer immunity (*e.g.*, Allen and Bosworth, *Vet. Journal*, Vol. 80, No. 9) in which guinea-pigs and sheep have been used.

Tables I to IV illustrate results obtained by us in work on a recently made batch of this product. Table I shows that a potent *Vibrion septique* toxin had been produced of which 0·001 c.c., injected intravenously, was sufficient to kill a mouse. The titration of this toxin against *Vibrion septique* antitoxin was carried out as indicated in Table II, which shows that the toxin used was a specific one and that it was necessary to add 50 c.c. antitoxin per litre to neutralise the toxin. Table III indicates that this batch of product conferred immunity against *B. chauvœi* infection in guinea-pigs, and in Table IV are results of similar experiments in which *Vibrion septique* toxin was used to test the immunity.

*Paper read before the North of England Division of the N.V.M.A. by Mr. T. Dalling, December 5th, 1925.

It may be of interest to know that sheep injected with a similarly-made product have been shown to develop an immunity against *B. chauvœi* and *Vibrion septique* infections, which conferred full protection against virulent culture injected eighteen months later. It is fairly certain that this immunity lasts for many years and probably for life.

Braxy in Sheep.

We have already shown that this chauvœi-septique prophylactic confers immunity against naturally occurring braxy (see *V. R.*, No. 28, Vol. 5). Since these results were published, we have had information on a small test carried out on sheep in Wales by Mr. N. Bisset, M.R.C.V.S., University College, Cardiff. One hundred young sheep were injected during the late autumn of 1924 with the preventive, and one hundred control sheep were kept under exactly similar conditions. The results at the end of the braxy season, 1924-25 were, that of the one hundred control sheep, eighteen had died of braxy, while of the one hundred inoculated ones, only one died.

Table I.

Titration of Vibrion septique Toxin.

Mice used—injections intravenously.

Toxin.	*Result.*
0·25 c.c. to 0·01 c.c.	All died.
0·005 c.c.	D.
0·001 c.c.	D.
0·0005 c.c.	L.

D = died. L = lived.

Table II.

Titration of Vibrion septique Anti-Toxin.

Mice used—injections intravenously.

Toxin.	*Serum.*	*Result.*
0·01 c.c. ...	0·001 c.c. ...	L.
0·02 c.c. ...	0·001 c.c. ...	L.
0·03 c.c. ...	0·001 c.c. ...	D.
0·04 c.c. ...	0·001 c.c. ...	D.

Neutral point — 0·02 toxin = 0·001 c.c. serum.

Toxin and serum mixed and stood one hour before injecting mice intravenously.

L. = lived. D. = died.

Table III.

Protective value of B. chauvœi Filtrate.

Four guinea-pigs injected with mixture containing 50 per cent. *B. chauvœi* filtrate.

Two doses given at interval of eleven days.

Test done of living culture five weeks later intramuscularly.

XUM

	Dose.	*Result.*
	1·0 c.c.	L.
	1·0 c.c.	L.
	0·5 c.c.	L.
	0·5 c.c.	L.
Control g.-ps. no filtrate—test only.	1·0 c.c.	D.
	0·5 c.c.	D.

L. = lived. D. = died.

TABLE IV.

PROTECTIVE VALUE OF VIBRION SEPTIQUE TOXIN-ANTITOXIN MIXTURE (NEUTRAL).

Four guinea-pigs each injected with 2 c.c. mixture containing 50 per cent. *Vibrion septique* toxin-antitoxin.

Two doses given at fourteen days' interval.

Test done of toxin intravenously four weeks later.

	Toxin.	*Result.*
	0·25 c.c.	D.
	0·25 c.c.	L.
	0·1 c.c.	L.
	0·1 c.c.	L.
Control g.-ps. No T.A.M. Test only	0·25 c.c.	D.
	0·1 c.c.	D.
	0·05 c.c.	D.

L. = lived. D. = died.

B. BRONCHISEPTICUS INFECTION IN DOGS.

We have already shown that, while the injection of guinea-pigs with killed cultures of *B. bronchisepticus* was followed by some immunity against subsequent lethal doses of the organism, the use of killed, followed by one dose of living, culture produced complete immunity more rapidly. The method adopted to produce immunity in dogs has, therefore, been the injection of two doses of killed, followed by one dose of living vaccine. We wished to ascertain whether the same degree of immunity would be produced if the dose of living culture used had been prepared and allowed to stand some days before injection. A large experiment was undertaken to determine this point. Table V shows the details and results. The earliest immunity is found in cases where the living vaccine is freshly prepared, also, the use of living vaccine which has stood for seven days before use in amounts corresponding to those of freshly-prepared culture, does not confer such a high degree of immunity as is obtained by using a larger dose of killed culture as a final injection.

Table VI is produced to show the titration of an anti-bronchisepticus serum recently made.

TABLE VI.

B. BRONCHISEPTICUS SERUM.

Guinea-pigs used.	*Injections intraperitoneally.*			
	Serum.	*Culture.*		*Result.*
	2·0 c.c.	... 5 c.c.	...	L.
	1·5 c.c.	... ,,	...	L.
	1·0 c.c.	... ,,	...	L.
	0·5 c.c.	... ,,	...	L.
	0·25 c.c.	... ,,	...	L.
	0·1 c.c.	... ,,	...	L.
	0·05 c.c.	... ,,	...	L.
N.H.S.	2·0 c.c.	... ,,	...	D. 1.
	0·1 c.c.	... ,,	...	D. 1.
No serum	—	... ,,	...	D. 1.

Serum and culture mixed and left at room temperature one hour before injecting.

L. = lived. D. 1 = died after 24 hours.

N.H.S. = Normal Horse Serum.

TABLE V.

B. BRONCHISEPTICUS.

G.P.	1st *Inoc.*	2nd *Inoc.*	3rd *Inoc.*	*Test.*	*Result.*
1	1·0 c.c. killed cult. subcut.	2·0 c.c. killed cult. subcut. 7 days later	0·5 c.c. living cult. subcut. 7 days later	4·0 c.c. living cult. I.P. 3 weeks later	L.
2					L.
3					L.
4			2·0 c.c. killed cult. subcut. 2 days later		L.
5					D.
6			0·5 c.c. 'stood' cult. subcut. 7 days later		L.
7					D.
8	Control test only.				D.
9	2 doses as above		2 doses as 1, 2 and 3	As above 4 weeks later	L.
10					L.
11					L.
12			2 doses as 4 and 5		L.
13					L.
14			2 doses as 6 and 7		D.
15					D.
16	Control test only.				
17	2 doses as above		2 doses as 1, 2 and 3	As above 5 weeks later	L.
18					L.
19					L.
20			2 doses as 4 and 5		L.
21					L.
22			2 doses as 6 and 7		D.
23					D.
24	Control test only.				D.

L = Lived. D = Died.

SWINE ERYSIPELAS.

Standardisation of Serum.—Two methods can be employed in the standardisation of anti-swine erysipelas serum:—

(*a*) Mouse method, (*b*) Pigeon method.

Mouse method.—Cultures of *B. erysipelatis suis* are grown in broth for twenty-four hours, when more broth is added to form a dilution of culture of 1 in 30. Varying doses of the serum to be tested, from 0·03 c.c. to 0·005 c.c., are injected subcutaneously into mice, and one hour later 0·3 c.c. of the diluted culture is injected intraperitoneally. Two mice are used for each dose of serum and deaths are recorded for seven days. Table VII illustrates the testing of a sample of serum by this method and a comparison with a standard serum, the results of which indicate that the test serum is of much higher value than the standard.

TABLE VII.

SWINE ERYSIPELAS SERUM.

Standardisation by Mouse Method.

Test Serum.	*Culture.*	*Result.*
0·005 c.c. ...	0·3 of 1/30 dil. ...	L. D. 7.
0·008 ,, ...	,, ...	L. D. 7.
0·01 ,, ...	,, ...	L. L.
0·015 ,, ...	,, ...	L. L.
0·02 ,, ...	,, ...	L. L.
0·03 ,, ...	,, ...	L. L.
Standard Serum.		
0·005 c.c. ...	0·3 of 1/30 dil. ...	D. 4. D. 4.
0·008 ,, ...	,, ...	D. 3. D. 4.
0·01 ,, ...	,, ...	D. 4. L.
0·015 ,, ...	,, ...	D. 4. L.
0·02 ,, ...	,, ...	L. L.
0·03 ,, ...	,, ...	L. L.
Control Mice.		
No serum ...	0·3 of 1/30 dil. ...	D. 3. D. 4.

Serum injected subcutaneously one hour before culture injected intraperitoneally.

D. 3., etc. = died on 3rd day, etc. L. = lived.

Pigeon method.—The M.L.D. for pigeons of a culture of the organism is established, injections being made intramuscularly. Serum in amounts of 0·1 c.c., 0·2 c.c. and 0·3 c.c. is then mixed with 500 M.L.D.'s of the culture and the whole injected intramuscularly. A sample of standard serum is tested in parallel. Table VIII indicates that 'X' serum is at least equal to standard, while 'Y' is below standard in value.

TABLE VIII.

SWINE ERYSIPELAS SERUM.

Standardisation by Pigeon Method.

Serum.	*Dose of Serum.*	*Culture.*	*Result.*
(X)	0·3 c.c.	500 M.L.D.	L.
	0·2 ,,	,,	L.
	0·1 ,,	,,	D. 4.
(Y)	0·3 ,,	,,	L.
	0·2 ,,	,,	D. 3.
	0·1 ,,	,,	D. 3.
Standard	0·3 c.c.	500 M.L.D.	L.
	0·2 ,,	,,	L.
	0·1 ,,	,,	D. 4.
No Serum		,,	D. 3.
		100 ,,	D. 4.
		10 ,,	D. 4.

Serum and culture mixed and injected intramuscularly.

L = lived. D. 3. = pigeon died 3rd day.

Active Immunity.—Two main methods for the production of active immunity in pigs against swine erysipelas, are in practice dependent on whether or not infection is present in the premises. The 'living culture' method is adopted on clean premises, while, where the disease already exists, the serum-virus method is practised. In the 'living culture' method, two doses of a living culture of the organism are injected at an interval of 7-10 days, no serum being used. The serum-virus method involves the injection of a living culture of *B.erysipelatis suis* and at the same time a dose of serum, followed in 7-10 days by an injection of living culture.

In our attempts to standardise vaccines for use in pigs, we have made use of pigeons for our preliminary work. Satisfactory pigeon methods will be tested in pigs. Table IX is the result of two such pigeon experiments in which (*a*) living cultures alone have been used, the result being that four out of seven pigeons were immune when tested four weeks after injecting, (*b*) the serum-virus method was adopted, after which four out of six pigeons treated resisted infection when tested.

TABLE IX.

SWINE ERYSIPELAS.

Active Immunity.

Pigeons used.

A. Living Culture.

Pigeon.	*1st. Inoc.*	*2nd. Inoc.*	*Test.*	*Result.*
1	0·0005 c.c. living culture subcut.	0·0005 c.c. living cult. subcut. 7 days later	0·01 c.c. living cult. intramuscularly 4 weeks later.	L.
2				D.
3				D.
4				L.
5				L.
6				L.
7				L.
8	Control—No vaccine.			D.

B. Serum and Virus followed by Virus.

Pigeon.	*1st. Inoc.*	*2nd. Inoc.*	*Test.*	*Result.*
1	0·001 c.c. living cult. +0·01 c.c. serum subcut.	0·005 c.c. living cult. 7 days later.	0·01 c.c. living cult. 4 weeks later.	D.
2				D.
3				L.
4				L.
5				L.
6				L.
7	Control—No vaccine.			D

L. = lived. D. = died.

Letospiral Canine Jaundice.

In the *Veterinary Journal* (Vol. 81, No. 1) was published an article by Okell, Dalling and Pugh, indicating that malignant or infectious jaundice in dogs can be produced by *Leptospira icterohæmorrhagicæ* and that an efficient antiserum had been produced. Such a serum is titrated in guinea-pigs. To show that this serum will protect dogs, even after infection has taken place, an experiment, shown in Table X, was undertaken. Of the dogs treated, dogs 1-6, which had been injected with the serum up to the fourth day after infection, remained healthy, showing no symptoms of jaundice. Serum was injected into dogs 7-10, ninety-six hours after infection, at which stage icterus was marked. All died from well marked malignant jaundice, as well as dog 11, which had received no serum. *Post-mortem* examinations confirmed the diagnosis of the disease. It is thus evident that antileptospira serum can protect dogs even after infection has taken place; its greatest use, however, is in preventing the spread of the disease to in-contact dogs in infected kennels.

Table X.

Antileptospira Serum.

Dog Experiment.

Dogs I—XI inoculated with virulent dog strain of leptospira intraperitoneally.

Dogs I and II	10 c.c. serum	24 hours later		L. L.
,, III and IV	,, ,,	48 ,, ,,		L. L.
,, V and VI	,, ,,	72 ,, ,,		L. L.
,, VII, VIII, IX, X	,, ,,	96 ,, ,,		D. D. D. D.
,, XI	No serum			D.

L. = lived. D. = died and showed typical P.M.

Active Immunity.

Japanese and other workers have stated that Weil's disease (leptospiral jaundice in the human subject) can be prevented by the use of vaccines composed of killed cultures of leptospiræ. We have attempted to immunise dogs by vaccination, the vaccines consisting of the ground-up livers of guinea-pigs which were infected with leptospiræ, treated to destroy the organism. Some preliminary laboratory experiments were carried out on puppies, the results of which led to a more extensive laboratory test. The results are shown in Table XI and indicate that complete protection was obtained after three injections of vaccine. The immunity test was severe, *viz.*, 1 c.c. of ground-up guinea-pig liver rich in virulent leptospiræ was injected. This was probably many times the dose necessary to infect a dog artificially and much more than any dog receives under natural conditions.

Field trials have been in progress for some time. The results of two trials are shown in Table XII, in both of which the control (uninoculated) and the inoculated groups of dogs were kept under exactly similar conditions. No special animals were chosen for either group. It is interesting to note that the inoculated dogs which died of leptospiral jaundice were of a group which had received one inoculation only.

Table XII.

Leptospira Vaccine.

Field Results.

Group A.

Control Dogs.	*Died.*	*Per cent.*	*Inoculated.*	*Died.*	*Per cent.*
34	8	23·5	94	0	0

All dogs had two inoculations at seven days interval.

Group B.

Control Dogs.	*Died.*	*Per cent.*	*Inoculated.*	*Died.*	*Per cent.*
17	8	47	35	2	5·7

Of the thirty-five dogs, twenty-eight had only one inoculation (two of these died). Seven had two inoculations (none died).

Table XI.

Laboratory Experiment on Dogs.

Group A.

Dog.	*1st Inoc.*	*Interval.*	*2nd Inoc.*	*Interval.*	*Test.*	*Result.*
19	1 c.c. phenolised g.-p. liver	7 days	As 1st	5 weeks	1 c.c. virulent g.-p. liver	L.
21						D.
36	Control—No vaccine					D.

Group B.

Dog.	*1st Inoc.*	*2nd Inoc.*	*3rd Inoc.*	*Test.*	*Result.*
37	1 c.c. phenolised g.-p. liver	As 1st 7 days later	As 1st 5 weeks later	1 c.c. virulent g.-p. liver 3 weeks later	L.
38					L.
39					L.
42					L.

Controls.

61	No vaccine—Test only.	D.
62		D.
63		D.
64		D.
65		D.
66		D.

L = Lived. D = Died. P.M. Typical.

TETANUS.

Standardisation of Antitoxin.—Tetanus antitoxin is used largely as a prophylactic agent against tetanus in horses; varying success is claimed by veterinary practitioners for its use as a curative in affected animals. Because of the amount of research work that has been done on tetanus toxin and antitoxin, standardisation can be done with great accuracy. For such work a standard toxin is necessary, which, after testing, is dried to a powder and kept for future use. In the experiment shown in Table XIII, 0·00066 gram was found to be the amount of dry toxin neutralised by 0·1 unit of a standard antitoxin (the unit of standard antitoxin being ten times the amount required to delay deaths in a guinea-pig of 350 grams weight for ninety-six hours after the injection of 100 M.L.D. toxin). It will be seen from the table that 0·008 c.c. of the test serum is sufficient to neutralise the test dose of toxin, *i.e.*, 0·0008 c.c. test serum is equivalent to 0·1 of a unit of standard antitoxin. In other words, the serum contains 1250 units per 10 c.c.

TABLE XIII.

TITRATION OF TETANUS ANTITOXIN.

Guinea-pigs of 350 gram weight used.

Toxin.	...	*Serum.*	...	*Result.*
0·00066 gm.	...	0·0006 c.c.	...	D. 48.
,,	...	0·0007 c.c.	...	D. 90.
,,	...	0·0008 c.c.	...	S.
,,	...	0·001 c.c.	...	S.

Three tests done on each serum. 0·0008 c.c. serum = 0·1 unit, therefore serum = 125 units per c.c., *i.e.*, 10 c.c. = 1250 units.

D. 90 = died of tetanus in ninety hours. S. = survived.

It has been shown by long experimentation that tetanus antitoxin deteriorates only at the rate of 5 per cent. per year if kept at ordinary temperature in the dark, and hence one can readily calculate the value of antitoxin after a number of years, being given its original value in units.

ACTIVE IMMUNITY.

Active immunity against tetanus has not been practised to any extent, yet a high degree can be secured. Buxton and Glenny (see *Lancet*, 1921, ii, 1109) have shown that horses containing no trace of normal tetanus antitoxin, when injected with definitely over-neutralised toxin-antitoxin mixture in three doses at three days intervals, have, one month later, resisted a dose of toxin of which 1/2000 part would kill a guinea-pig. They also showed that four horses immunised as above were able, two months later, to tolerate 2 c.c. of actively growing *B. tetani* culture mixed up with sterile garden soil and injected intramuscularly. Further, in immunising horses in the production of tetanus antitoxin, one dose of over-neutralised toxin-antitoxin mixture is given. Some weeks later a horse so injected will tolerate a large amount of crude tetanus toxin sufficient to kill any untreated horse.

TUBERCULOSIS.

Standardisation of Tuberculin.—Several methods are used for the standardisation of tuberculin. At the Wellcome Physiological Research Laboratories a double guinea-pig test is adopted, (*a*) intradermic test, (*b*) subcutaneous test (*vide* Eagleton, *Lancet*, 1921, i, 429).

A number of guinea-pigs are injected with virulent living T.B. culture and are examined at intervals for evidence of infection. Table XIV summarises the methods. When infection is believed to have advanced sufficiently, a *preliminary intradermic test* is carried out, *i.e.*, a standard tuberculin is diluted in saline to 1-500; 1-1000; 1-2000, and 0·2 c.c. of each is injected intradermically into areas from which the hair has been removed. If definite reactions are found twenty-four hours later, the *main intradermic test* is carried out in which lower dilutions of the standard tuberculin are made with a corresponding series of dilutions of the test tuberculins. All dilutions are injected on the same animals and thus true comparative readings can be made between the standard and test tuberculins. The advantage of the intradermic method of standardisation is that the same animal shows the reactions of the test and the standard tuberculins, and the degree of difference between standard and test tuberculin can be ascertained.

The subcutaneous test can now be carried out. *A preliminary test* is done, using standard tuberculin. When guinea-pigs are sufficiently sensitive, 0·1 c.c. should kill 50 per cent. of those injected within twenty-four hours. The *main subcutaneous test* is now undertaken, when different animals are injected with corresponding doses of standard and test tuberculins. If the tuberculins are equal, the death rate amongst the injected guinea-pigs will be equal. The test is not such a delicate one as the intradermic.

TABLE XIV.

STANDARDISATION OF TUBERCULIN.

Fifty guinea-pigs injected with living virulent T.B.

A. After ten days. *Preliminary Intradermic Test.*
0·2 c.c. standard tuberculin diluted.
1/500, 1/1000, 1/2000.

B. *Main Intradermic Test.*

	1/1000,		1/2000,		1/4000,	1/8000.
Standard tuberculin...	+	+	+	+	±	±	±
Sample tuberculin ...	+	+	+	+	±	±	±

C. *Preliminary Subcutaneous Test.*

Standard tuberculin injected.			
0·25	...	...	+
0·1	...	...	+
0·1	...	...	S.

D. *Main Subcutaneous Test.*

	Tuberculin.			*Dose.*		*Result.*
Standard	...	...	...	0·1	...	†
				0·1	...	S.
Sample	...	...	...	0·1	...	†
				0·1	...	S.

† = died within twenty-four hours. S. = survived.
+ + ± ± ± ± = Degrees of reaction.

XUM

Discussion.

The President, in opening the discussion, said they were grateful to Mr. Dalling for the time and trouble he had expended in the preparation of his paper and for the clear manner in which he had explained the methods of standardisation. The subject matter was of such interest that he would call upon each member present to take part in the discussion.

Mr. C. Elphick felt that they had had an intellectual feast. They could now clearly see how the laboratories were helping them with their various troubles, and they were better able to appreciate the care that was expended to ensure that their products were of a standard potency.

He wished to ask Mr. Dalling a few questions.

(1) Was leptospiral jaundice the same disease as that known as "The Yellows," and was that a form of distemper?

(2) How could they diagnose leptospiral jaundice?

(3) Why did the intradermic tuberculin not react in one case; also how was the eye reaction accounted for?

Mr. Davidson added his note of appreciation to the lecture. He had found the intradermic tuberculin test reliable.

In cases of tetanus, what number of units of anti-serum did Mr. Dalling suggest as appropriate? He had used 3,000 units, only to find that the animal died.

Mr. Jackson Young expressed great pleasure at hearing Mr. Dalling and said each one should try for himself the products which had been mentioned. He was particularly interested to hear that blackleg vaccine gave immunity for at least twelve months.

Referring to braxy, he said that one preparation contained garlic; this, of course, should not be used.

He would like to know the length of the time considered appropriate for pigs injected with swine erysipelas serum to remain in contact with infected animals. His own view was that, in the case of swine erysipelas, hygiene was of greater importance than serum.

Mr. Young was further interested to know whether there was any advantage to be gained in preparing tuberculin from the strain of organism in this country.

Mr. Hill asked the dosage which Mr. Dalling would advise when using tetanus anti-serum. In the treatment of tetanus cases he had obtained better results without the use of serum. Like Mr. Elphick, he was anxious to learn how to diagnose leptospiral jaundice.

Speaking of blackleg, Mr. Hill had had excellent results from the vaccine. He had never had a death following its use.

Mr. Forbes had had better results in tetanus cases when large doses of anti-serum had been used. He had always found blackquarter vaccine to give excellent results.

Mr. Starkey put forward a problem. He had never had sucking puppies affected with distemper, or sucking pigs with swine erysipelas. He bred puppies in his distemper kennels and never had trouble. He would like Mr. Dalling to give the reason for this experience.

Mr. Taylor hoped Mr. Dalling, having once visited the North of England Division, would return again to give them more information on laboratory methods.

In tetanus cases he had given up the use of anti-serum as a curative measure.

Mr. Thompson said he had derived no benefit from the use of tetanus anti-serum as a curative agent.

Mr. Dalling, in his reply, said that leptospiral jaundice was characterised by a gastro-intestinal inflammation. There was no biological test for the disease.

The reason for the ophthalmic reaction to tuberculin was to be found in the extreme sensitivity of the eye.

Tetanus anti-serum was of little value in the severe case, where there was much damage to nerve tissue. It would help to counteract toxin in the circulation.

In reply to Mr. Jackson Young, he said he had isolated the *Vibrion septique* from cases of blackleg. He did not think that the strain of tubercle bacillus used in the making of tuberculin would have much effect upon its diagnostic value.

Mr. Starkey's problem depended on the fact that the young animal received immune bodies from the mother. These were elaborated by the brood bitch and passed on to the young in the milk.

The President proposed a hearty vote of thanks to Mr. Dalling for his address, and to Messrs. Broadhead and Sargeant for their kindness in working the lantern.

The proposal was seconded by Mr. Davidson, and carried with acclamation.

Evolution of Morals.

Continuity from Animals to Man.

"The hypothesis of mental continuity throughout organic evolution has," says the *British Medical Journal*, "been a great stimulus to the study of animal behaviour, and investigations which have been made on animals under both natural and experimental conditions have been most fruitful for psychology. As a result of such studies it is now generally held that the powers of the human mind differ in degree rather than in kind from those of the lower animals, and that rudiments for all mental functions may be discovered in animal behaviour. We may take the opportunity of the publication of two small books briefly to review the situation. The aim of both volumes is to examine the problem of good and evil from the standard of the biologist and philosopher respectively. The one is entitled *The Passing of the Phantom*,[1] by Dr. C. J. Patten, professor of anatomy in the University of Sheffield, who writes on definitely popular lines; the other is an historical introduction to ethics,[2] by Mr. Stephen Ward, who endeavours to outline the develop-

[1] *The Passing of the Phantom: A Study of Evolutionary Psychology and Morals.* By C. J. Patten, M.A., M.D., Sc.D. London; Kegan Paul, Trench, Trübner and Co. 2s. 6d. net.

[2] *Ethics: An Historical Introduction.* By Stephen Ward. London: H. Milford, Oxford University Press. 2s. 6d. net.

ment of abstract ethical speculations from the time of Socrates to the present day.

"The assumption is that the rudiments of what we describe as moral behaviour should be discoverable in animals, and this is the subject considered by Professor Patten, who seeks to establish the thesis that moral functions, like other mental functions, are not exclusively human characteristics, and that there is no breach of continuity in their evolution from lower animals to man. As evidences of a moral sense in the animal world he cites the behaviour of ants; the tenderness and anxious curiosity exhibited by gulls towards a wounded member of the flock; the mutual aid rendered by birds of different species against a common enemy; the amiability of fierce predatory animals at certain times; and the harmony which often exists between domestic pets, such as the cat and dog—animals proverbially assumed to be hostile to one another. Perhaps the most striking instance of unconscious altruism in the animal world is the devotion unto death exhibited by many an animal mother when her young are threatened. It is curious that Dr. Patten should have omitted to mention this, because it is a fact of peculiar importance in any discussion on the evolution of ethics. Dr. McDougall has pointed out that the maternal attitude in such a case upsets the utilitarian theory of motives, for no nice calculation of the balance of pleasure over pain can be supposed to sustain her efforts, and she has certainly no unshakable belief in heavenly rewards or hellish punishments. She takes no thought for the morrow, anticipates neither good nor evil, neither pleasure nor pain; but, heedless of all consequences, makes one supreme self-sacrificing effort to fulfil the purpose of her being.

"Though Mr. Ward makes a gallant effort to outline the trend of modern ethical thought, his treatment of the subject is not free from obscurity. If we understand his views rightly, he would maintain that the behaviour observed in the animal mother affords us an uncomplicated example of goodness and its manner of development. The animal which defends its young is not seeking to be good or self-denying; it is actuated by an inner impulsion to behave in a particular way, and in so doing quite unconsciously becomes a heroine. By aiming at something else, goodness, as it were, emerges. The fact that the goodness is unconscious makes it all the more good, for Mr. Ward holds that the essence of virtue consists in the fact that no man should know that he possesses it. Others can perceive it; but this, if he is to retain it, is just what he must not perceive. His defects he knows for himself, but he is good only for others. The artist can enjoy his work, the learned man his learning; but the enjoyment of our own goodness is denied us all. Goodness is like happiness, in so far as it is not best achieved by those who seek it directly; or, as Mr. Ward puts it, ideals are ethically more efficient the more their ethical aspect is ignored. Thus, morally the idea of self-realisation is unsatisfactory, because it postulates an end and perfection in the self which it clearly does not possess. But if self-realisation is urged for its own sake, as the sole condition upon which anything else can arise, the ethical difficulties disappear. So with the ideal of self-denial. If the self were moral, no one would wish to deny it; but in a non-moral setting self-denial is merely the other side of self-realisation. Man denies himself, not because this is good in itself—which it is not—but because effort, endeavour, and work are the only conditions upon which he can be anything at all. If a man fulfils the condition of his being—namely, that he should be something—the rest follows. As he creates himself, so do truth and goodness supervene.

"Mr. Ward contends that such considerations dispose of the theory that the moral and spiritual growth of man are in some sort an automatic process in which our sole concern is to see that the external conditions are favourable. Thus it has been argued that only good education is needed to make man wise; only a competence to make him virtuous; that by wealth and civilisation life can be made easy. The difficulty of life is obviously a constant factor. New conditions create new difficulties, and though this is no reason for not removing such difficulties as we can, it should put a stop to vain hopes of an end to trouble.

"Thus goodness, as Mr. Ward describes it, is not something imposed upon us from without; rather is it something which we unconsciously create ourselves in the process of self-realisation. The more our potentialities are free to develop the better we shall be. The fact that activity is worth while for its own sake, apart from any material or moral consequences which may ensue, is exemplified in the life of all living creatures. Our civilisation is not founded on any such principle, however, but on utilitarianism. It relies upon material rewards and punishments, upon praise and blame, and upon moral and religious sanctions; and it is generally considered that the disappearance of any of these three classes of incentives to good behaviour would wreck the whole of our existing social machinery. Many persons, indeed, view with much apprehension the decay of dogmatic religious beliefs, which is so marked a tendency of modern life. Dr. Patten does not hold this view, however; he considers that morality will develop as the revelational theory of ethics declines. In tracing the evolution of human morality he implies that superstitious fear, carrying with it notions of rewards and punishments, has been the dominant factor in the development of religious systems, together with the moral codes associated with them. Animal studies have led him to the view that the tendency to imagine spiritual essences in natural objects has had its origin in creatures below the human race, and he brings evidence to establish the proposition that the imaginative faculties which became so highly developed in humanity have been responsible for the evolution of superstition and conceptions of the supernatural. Most of us have observed the behaviour of a dog confronted with an unusual object which does not fit in with his experience of the nature of things. He barks and growls fearfully and angrily, and his hair becomes erect. But this is not all; he betrays curiosity and feelings of attraction as well, exhibiting in his behaviour an exquisite example of conflicting impulses as he retreats and advances alternately. Curiosity generally wins, however, and he eventually makes friends with the unknown. Dr. Patten outlines the story of a similar conflict in mankind; we might, indeed, describe this simple episode taken from

XUM

animal life as an abridged history of the moral and intellectual development of the human species: the fear of the supernatural or unknown has been the tap-root of all the theologies which have evolved without breach of continuity from the time of primeval man until the present, and a form of 'morality' must needs have accompanied these religious systems hand in hand, because they contained dictates regarding the meaning of right and wrong given forth through human instrumentality by supposed supernatural beings. As a biologist, however, Dr. Patten holds that the phantasies and speculations of human beings are themselves natural products and part of the scheme of evolution. Contained within and emerging from animistic conceptions of the universe are the germs of scientific thought and a moral outlook founded on the laws of nature. Like everything else in nature, human conceptions are subject to growth, change, and transformation, and there would appear to be no reason why the conflict between naturalism and supernaturalism should not eventually be resolved, and why philosophy, religion, and science should not ultimately fuse into a single body of wisdom. This is evidently Dr. Patten's hope, for he would seem to feel that by the patient study of nature we shall reach enlightenment and a moral outlook based, not upon fear and ignorance, but upon trust and knowledge."

Concentrated Preparations of Vitamins.

"The study of vitamins is passing out of the purely descriptive stage in which the aim of workers was to discover what foodstuffs contain vitamins, and all over the world work is proceeding with the object of isolating these elusive principles in a pure form.

"The first successes in this direction were obtained with vitamin B, and some years ago preparations were obtained from yeast of which the vitamin B content was thousands of times greater than that of the original yeast; a few milligrams of these preparations sufficed, for example, to cure pigeons of polyneuritis. Similar successes are now reported with vitamin C; de Zilva[1] and his fellow workers have succeeded in isolating from a litre of lemon juice 0·3 gram of material which they believe contains practically all the vitamin C present in the original lemon juice. This is a three-thousandfold concentration, and since a daily dose of about 2 c.cm. of fresh lemon juice suffices to protect a guinea-pig from scurvy, it follows that the guinea-pig dose of concentrated principle is less than a milligram. Still more remarkable results have been obtained with vitamin A. Drummond and Coward[2] have shown that the vitamin A present in cod-liver oil can be concentrated into a residue weighing only about 0·5 per cent. of the original oil. It is certain that the vitamin only represents a fraction of this residue, and since less than 10 mg. of cod-liver oil suffices to promote growth in rats the amount of vitamin A needed as a daily dose by a rat must be of the order of less than 0·01 mg. This is confirmed by the observation of Drummond, Rosenheim, and Coward,[2] who found that 1 mg. daily of irradiated cholesterol was sufficient to promote growth in rats, and that the fraction of the cholesterol altered by radiation was too small to be detected by chemical means.

"This concentration of vitamins is of importance in several ways. In the first place, it is of some therapeutic importance, because relatively enormous quantities of vitamins can be given in a single dose. For example, the vitamin C content of twenty or more lemons could be given, if this were thought advisable, to an infant in a single dose in the form of the concentrated preparation. Intensive treatment of this kind may prove valuable as an emergency measure in the treatment of deficiency diseases.

"Prevention, however, is much more important than cure in deficiency diseases, and it is to be hoped that spread of knowledge regarding vitamins will soon make deficiency diseases medical curiosities. At present there is no evidence to show that a luxus supply of vitamins is superior to an adequate supply, and hence for routine use as protectives the concentrated vitamin preparations have no outstanding superiority over the ordinary crude sources, and the latter have, of course, the great advantage of being cheaper. The purification of vitamins, which is proceeding step by step, should in time, however, lead to the discovery of their chemical nature, which would be the first step towards their artificial production. Curiously enough, the biochemists have discovered how to produce vitamin A by means of ultra-violet light before they have learnt its chemical nature.

"Finally, a knowledge of the quantities of vitamins needed by the body should throw some light on their mode of action. In the case of the rat and vitamin A for instance, we know that the vitamin need of the animal is proportional to its rate of growth, and that the daily requirement is of the order of one-hundredth of a milligram. This quantity appears to be impossibly small, but it can be paralleled among the internal secretions; for example, the amount of adrenaline secreted daily by the suprarenals of a rat would probably be of a similar order. If it should be discovered that the vitamins are some essential precursors of internal secretions which most animals cannot synthetize, just as a supply of iodine is an essential for the production of thyroid secretion, then the smallness of the amounts necessary would at once be explained. This is, of course, a mere speculation, but the minute quantities of the vitamins which are required does suggest that their action is more likely to be associated with the repair of protoplasm than with the metabolism of food."—*British Medical Journal.*

[1] De Zilva: *Journ. Soc. Chem. Industries*, 1925, 44, 445.
[2] Drummond, Rosenheim, and Coward: *Ibid.*, 1925, 44, 123.

R.C.V.S. Obituary.

Coveney, William, Headcorn, Ashford, Kent. Graduated London, 20th April, 1869. Died, 7th January, 1926.

Lindsay, Francis, Derryboy, Crossgar, Co. Down. Graduated, London, 16th May, 1895. Died 6th January, 1926.

Appointment.

Government of Burma Gazette, Notification, dated Rangoon, the 16th, December, 1925: "Captain J. Birkenshaw-Idle, I.V.S., is confirmed in his appointment in the Indian Veterinary Service with effect from the 4-12-25."

The Veterinary Record.
23rd January, 1926.

STANDARDISATION OF BIOLOGICAL PRODUCTS.

The practical application of methods based upon our present knowledge of the immensely important subject of immunity, to the prevention and treatment of disease is of relatively recent origin. Although the employment of these biological substances has increased to such an extent as to have become a routine procedure in many instances, few realise the infinite amount of care and not inconsiderable expense which are involved by institutions in respect of the standardisation of such products.

It is not only the process of standardisation which requires skill and thoroughness on the part of those who are entrusted with the work, but such highly-trained research workers are constantly employed in determining the necessary standards of potency of the many and various products, and in evolving suitable, reliable methods of ascertaining the relative value of such products when compared with acknowledged standards.

The paper by Messrs. Allen, Dalling, and Mason indicates in some measure the considerable amount of knowledge and skill which are called for on the part of those who are entrusted with such work. It also serves to show how careful are the methods employed by commercial institutions in determining the value of the products which they supply. The communication shows, further, that had these products, destined for use in the lower animals, been included in the Therapeutic Substances Act, no extra cost would have been incurred by veterinary surgeons or their clients, since elaborate methods of standardisation are already employed.

Tetanus Anti-Toxin.

M. Ramon, who is head of the Veterinary Department of the Pasteur Institute at Garches, on the outskirts of Paris, has made a communication to the Academy of Sciences, concerning the discovery of an anti-toxin against tetanus, by which immunity from the bacillus can be secured without any reaction on the part of the individual vaccinated.

M. Ramon obtained some time ago an anti-toxin against diphtheria. This is the second discovery of the sort that has been definitely announced, but it is known that he has also made conclusive experiments with an anti-toxin against typhoid fever, and has been able to combine this with the anti-toxin against tetanus so that the two can be administered simultaneously. This method of inoculation should be of great value for armies.—*The Times.*

CLINICAL NOTE.

Value of Dyes in the Treatment of Anthrax Septicæmia.

(Victor Burke and E. A. Rodier, in the *Journal A. V.M. A.*, Nov., 1925).

The need of a chemotherapeutic agent for the treatment of anthrax infection in stock is obvious. The cost of anthrax immune serum is almost prohibitive for the curative treatment of ordinary stock. An outbreak of anthrax means the loss of a number of animals before complete immunity can be developed by vaccination. Vaccination of uninfected herds occasionally results in some loss, due to the virulence of the vaccine or special susceptibility of a few individuals in the herd. A cheap chemical disinfectant that can be used to save such animals should be of value.

Recent work has shown that certain dyes, particularly the tryphenylmethane and acridine dyes, are powerful disinfectants and can be used intravenously with marked results in the treatment of various kinds of septicæmia. We find no record of dye having been used in the treatment of anthrax septicæmia. Churchman[1] first demonstrated that gentian violet would inhibit *Bacillus anthracis* and kill many of the cells. To determine the bactericidal action he stained suspensions of the organisms and injected the stained organisms in mice. Death was delayed but not prevented. Burke and Skinner[2] have shown that the spores of anthrax are highly resistant to gentian violet. Death of the mice in Churchman's experiments was probably due, as he suggests, to the spores resisting the action of the dye. It is obvious that destroying the organisms in a test-tube is quite different from destroying them in the circulating blood. There are no spores in the blood stream, but the dye is in weaker dilution and the blood reduces its bacteriostatic action. The resistance of the animal to anthrax is also a factor. The authors here report the results of applying dye therapy in the treatment of sheep suffering with anthrax septicæmia.

Anthrax appeared among the dairy cattle on a local farm in February, 1925. On February 23rd, 1925, a band of seventy sheep was vaccinated with anthrax spore vaccine by the simultaneous method. On the morning of March 2nd, one of these sheep, apparently normal the evening before, was found dead of anthrax. During the following ten days seven more of the sheep were found dead of anthrax. The progress of the disease in these sheep was rapid, the majority dying before the herdsman noticed any evidence of illness. Eleven more sheep became infected and all were injected intravenously with a methyl violet or neutral acriflavine solution.

The first three sheep treated were in a serious condition, being more or less prostrate and discharging a bloody exudate. Judging from the appearance of these sheep, and the rapid death of the eight sheep that had died, these sheep untreated would have died in less than 24 hours. Each sheep was given 7 mg.

XUM

per kilo (2·2 lbs.) of body weight of methyl violet in a 1 per cent. aqueous solution. One sheep died in 36 hours. The other two received two further injections, 40 hours apart, and made rapid and uneventful recoveries. Of the eight other sheep treated four received injections of methyl violet and four injections of neutral acriflavine. All recovered.

The evidence of the value of the dyes in the treatment of anthrax septicæmia, as presented by this series of cases, is suggestive rather than conclusive. The development of immunity as the result of the vaccination is an interfering factor. However, the results obtained are worthy of record and justify further clinical application. Experimental work on this subject will be carried on by the authors during the year.

We recommend the following procedure in the preparation and injection of the dyes: Make up a 1 per cent. solution, 1 gram of dye per 100 cc. of distilled or tap water. Saline solution can be used with neutral acriflavine but not with the violet dyes. Tap water is better than distilled water because it is more alkaline. Add the dye to the water, which has previously been warmed to body temperature, shake vigorously for ten minutes, filter through filter paper, and inject immediately at body temperature. The dye should be injected slowly over a period of 10-15 minutes. The value of aqueous solutions put out by supply houses has not been determined. Gentian violet and methyl violet solutions, prepared in saline or alkaline water, break down rapidly but, if prepared with distilled water, keep for months. Acriflavine is more stable in a saline solution than is gentian violet. We do not know how long it will retain its bactericidal action in the different solvents. On account of the changes that may occur in dye solutions upon standing, we recommend that all solutions be freshly prepared.

We used a methyl violet manufactured by the National Aniline and Chemical Company for the Gram stain and a neutral acriflavine produced by the Abbott Laboratories. As manufactured by the producers, gentian violet is either a methyl violet, a crystal violet or a mixture of the two. These three dyes have approximately equal bactericidal action. However, since the manufacturers especially prepare a gentian violet (gentian violet medicinal) for intravenous use, we recommend that it be used in place of the dyes prepared for the Gram stain. Different grades of acriflavine are available. The choice should lie with those labelled for intravenous use. Whether these are more bactericidal or less toxic to the animal has not been determined. Since the results obtained may vary with the dye used and the method of its preparation, it is advisable that only standard dyes be used and these prepared fresh as outlined.

The maximum dose at any one injection is 7 mg. per kilo of body weight. Larger doses have been given, both clinically and experimentally, in the treatment of other types of infections with variable results. Our own experiments indicate that unless the solution is made alkaline, 7 mg. per kilo is the largest dose that should be given, particularly if the dose is to be repeated. Normal animals resist this dose repeated on two or three successive days. However, it is advisable, if repetition of the dose is necessary, to give it every 48 hours, rather than at 24-hour intervals. If smaller doses are given they can be repeated oftener. The amount of a 1 per cent. solution to be used with each animal is readily determined by simple calculation on the basis that 23 cc. of a 1 per cent. solution per 100 pounds of animal weight gives 5 mg. per kilo of body weight and 34 cc. of a 1 per cent. solution per 100 pounds gives approximately 7 mg. per kilo of body weight.

Care should be taken not to allow acriflavine to get into the subcutaneous tissues, as it may cause a permanent œdema or necrosis. The violet dyes are less toxic to the subcutaneous tissues. Since they are supposed to be more effective for Gram-positive organisms, we recommend their use in anthrax infection in preference to the acriflavine.

REFERENCES.

[1]Churchman, John W., : The selective action of gentian violet. Jour. Exp. Med., xvi. (1912), p. 221.

[2]Burke, Victor & Skinner, Horace: Resistance of bacterial spores to the triphenylmethane dyes. Jour. Exp. Med., xli. (1925), p. 471.

REVIEW.

LIVE STOCK JOURNAL ANNUAL, 1926.

The "Live Stock Journal Annual," 1926, just published, makes its appearance at the close of a year which has held some disappointment for stockbreeders. Breeders were only getting over the outbreaks of foot-and-mouth disease which swept the country in 1923 and last year, and, indeed, just as the Ministry's "all clear" was sounded, the brightening flame of our export trade was abruptly extinguished by a widespread recurrence of the disease. This was in September, when exporters were beginning to get busy with customers in South America and elsewhere. Prices were rising all round, and breeders were anticipating a compensatory period of prosperity. At the moment, restrictions in many parts have put a stop to all trading.

The pedigree breeder's loss is often irreparable and the only consolation he can have is that the slaughter policy is being rigidly adhered to.

The disease inevitably therefore occupies, in many instances, a front rank place in the reviews of the various breeds in the "Annual," which in many respects is an even better number this year than ever. As a work of reference alone the "Annual" has long held an authoritative position, while the general articles which appear this year cover a wider range of interest than heretofore. The book forms a cheap and valuable present for anyone interested in stockbreeding. Slightly larger than usual, all the customary features are included, while several new writers, whose words are always noted with attention, make their debut in its pages.

Mr. James Forshaw, of Carlton Shire Stud fame, is a practical farmer, and in his "Message to the Tenant-Farmer" on Shire breeding he gives practical advice.

Despite the widespread " mechanicalisation " of transport heavy draught horses to-day fill a place in agriculture and commerce which cannot be economically filled by any other form of traction. As Mr. Forshaw says :—

They are in favour with users through the fact that they can be economically used against any other form of locomotion on certain classes of work. They are in great demand throughout the big cities, such as London, Liverpool and Manchester. Companies and corporations using haulage all ask to be supplied with the largest and most powerful Shires, and thus the Shire in commerce is an economical factor, and not a luxury—he is wanted for his value as a weight-shifter, and looks like being wanted for many years to come.

As to the future, Mr. Forshaw offers the following sane advice :—

. . . to-day, we are only breeding about 40,000 draught foals annually (against close on 100,000 pre-war), and this is not enough to keep agriculture supplied with draught horses. Now that we are entering on and beginning to draw from the supply of the years in which a much smaller number of foals was bred, horses are bound to be dearer, so that I advise all those with Shires one year, two years and three years of age to hold on for better prices, which will come as soon as the scarcity is thoroughly realised, and the steady demand finds a short supply. It takes six years to breed a horse for the market ! Again, the army horses are now about worked off the streets and must be replaced.

Mr. Forshaw strongly emphasises, however, the necessity for breeding the right type.

The breed articles start, as usual, with the heavy horse. Mr. J. Albert Frost, writing on Shires, prefaces an excellent article with the statement that perhaps the most pleasing point in connection with Shire horse breeding during the past year has been the steady demand and the high prices given for powerful town geldings.

When it is stated that the Corporations of these two towns (Liverpool and Birmingham) use, approximately, a thousand Shires (including a few mares) as well as their motor vehicles, it is obvious that the demand from English towns collectively must be sufficient to swallow up all the massive geldings and barren mares that members of the Shire Horse Society can produce, especially when the commercial demand—viz., that from brewers, cartage contractors, coal merchants and the like—is added on to the municipal market. Breeders must, however, " keep the lorry in view " while breeding and rearing their draught horses. An undersized, light-limbed gelding is not wanted by Liverpool lorry users, no matter how " smart " he may be. Size and substance are the essentials, and it is only the true " Old English " cart horse that possesses these qualifications.

Three pages of show reviews support Mr. Frost's claim for the breed's popularity. As to the future, he says :—

There has been a scarcity in the number of stallion-making foals during the past few years, and as no other are qualified to maintain the standard already set up by British Shire breeders, sires combining merit with good blood are appreciating in value. Unquestionably the future outlook for heavy horse breeders is improving, and it is quite possible that the trade will be booming for the Jubilee of the Shire Horse Society.

Hardly so optimistic is " Jayell," writing of the Clydesdale :—

Breeders of the Scottish draught horse have had little cause for enthusiasm during the past twelve months. The low state of the market has had a dulling effect on all activities, and breeding is practically unprofitable. There is a fair outlet for good geldings, but except for toppers the demand for mares, fillies and colts is limited. With such conditions prevailing it stands to reason that the hiring of premium horses is not now so actively engaged in by district societies, and stallion owners are feeling the draught considerably.

" Lavengro," on the other hand, has nothing but progress to record in the Suffolk Punch world. The breed is going ahead all over the country, and prices are being well maintained.

A war-time bequest to heavy horse breeders was the Percheron, which since 1918 has secured a fair following in this country. " Lagor," dealing with the breed in 1925, is quite satisfied with the progress made, " and there have been some new developments which may be far reaching in their consequences."

Mr. W. Scarth Dixon, who is very well qualified to judge by an experience of more years than he probably feels inclined to remember, asserts in his review of Hunters that the past season has been the best for twenty years. Everything, he says, has been working in this direction for some years. The horses in the riding classes have had less of the upstanding, flashy, riding-school type and more of the workmanlike Hunter about them, and in the brood mare and breeding classes there has been a more level type, and the classes have been more even in character than they have been for a long time. Of course, progress in this direction has been gradual, but at last the Hunter is developing breed characteristics such as he has not shown before. There can be no doubt that the improvement is due, in a great measure, to the good blood introduced into the country through the King's Premium horses.

It seems a great pity that the mooted amalgamation of the Cleveland Bay and Yorkshire Coach Horse Societies cannot be realised. Mr. Scarth Dixon, in his review of the breeds, during the year, says :—

The only thing which stops the amalgamation now seems to be that the Yorkshire Coach Horse Society does not believe in the general utility type which Cleveland Bay breeders have lately, and, I think, wisely advocated, preferring the tall, high-actioned horse. But surely if this is all that there is between them a way can be found out of the difficulty, which certainly does not seem insuperable, so let us hope for the best.

" Cestrian " writes on " Harness Horses in 1925." The Americans have, he tells us, bought heavily of England's best during the past year. Of Hackneys in 1925, " Blue Cap " says :—

Breeding classes among Hackneys at many shows this season have produced but few entries, and it is a fact that large studs during the last few years have become fewer in number. Stallions able to get top quality harness specimens are difficult to find, and as yet the mantle of Mathias has not fallen upon a real successor.

The cattle reviews are prefaced by a short article on the famous Sittyton bull Champion of England. Breeders of beef Shorthorns to-day perhaps do not appreciate the enormous extent to which the blood of Champion of England is to be found in the pedigrees of modern cattle. Things are not too bright for the cattle breeder at the moment. Apart from the hardships attendant on foot-and-mouth disease, English Governments have not exactly showered benefits on the industry.

The Hereford breed continued to make great progress in 1925, both at home and overseas, although the contined foot-and-mouth disease restrictions upon shipment again hampered the export trade. Luckily it is again possible to record the fact that the breed in England has not had a herd affected since this disease made its reappearance some five years ago.

XUM

DIVISIONAL REPORTS.

North of England Division.

A meeting of the North of England Division was held in the Friends' School Premises, Darlington, on 4th December, 1925. The chair was occupied by the President, Mr. T. T. Jack, and there were also present Messrs. Thompson, T. M. Mitchell, Wilkinson, Peele, J. Davidson, C. Elphick, J. H. Taylor, Starkey, Towell, Hill, Forbes, Gibson, and J. R. Rider, Hon. Secretary.

Visitors.—Messrs. T. Dalling, Jackson Young, Ollerhead, J. Broadhead and R. H. Sargeant.

Apologies for absence were received from Messrs. Snaith, Howie, J. W. Rider, Pratt, Hicks, Hoadley and Dotchin.

Correspondence.—(1) From Mr. W. M. Lyon, Wooler, asking that his name be withdrawn from those proposed for election, on the ground that it was impossible for him to attend the meetings.

Mr. Lyon's withdrawal was accepted with regret.

(2) From the President N.V.M.A., inviting the Division to become financially responsible for its link in the presidential chain of office.

It was agreed to subscribe the specified amount of £2 for the link, on the proposal of Mr. DAVIDSON, seconded by Mr. HILL.

(3) A circular letter signed by Messrs. J. Donaldson Pottie and Donald Campbell, relating to the Milk and Dairies (Scotland) Act, 1914.

The Secretary was instructed to reply that, as the matters referred to in the circular letter were receiving the consideration of the Council of the N.V.M.A., the North of England Division felt that the question could safely be left to that body.

(4) From the Hon. Secretary, Garnett Memorial Fund, with reference to the collection of individual subscriptions from members.

Mr. TAYLOR proposed that a small committee be formed to give effect to the suggestions contained in the letter, but his motion failed to secure a seconder, and no action was taken.

ELECTION OF NEW MEMBERS: Messrs. S. C. Binks, Alnmouth, and F. S. Whitfield, Sunderland, were unanimously elected members of the Association.

NOMINATIONS: Mr. R. Simpson, Cumberland County Council, was nominated for membership.

ELECTION OF OFFICERS.

The PRESIDENT said that the Council had given careful consideration to this matter, and he was glad to say that his nomination of his successor had become the unanimous recommendation of the Council. It gave him great pleasure to propose the name of Mr. T. Wilkinson as President for the ensuing year. Mr. Wilkinson was one of the oldest members, a regular attender at the meetings, and he wished him a very successful year of office. The proposal was seconded by Mr. DAVIDSON, supported by Mr. HILL, and carried with acclamation.

Mr. WILKINSON, in returning thanks, said he would do his best to carry on the traditions of the Presidential Chair, although he felt the choice of the meeting was not the best which might have been made.

The PRESIDENT said the Council felt that the best interests of the Association would be served by electing as Senior Vice-President the retiring President; the Junior Vice-President to become President in the succeeding year. Accordingly he submitted the names of Messrs. T. T. Jack, and J. W. Rider. This proposal was carried unanimously.

The Hon. Secretary and Treasurer, and the Hon. Auditors (Messrs. H. S. Elphick and H. Hicks) were re-elected.

Mr. FORBES proposed and Mr. ELPHICK seconded that the five members of Council be re-elected, the proposal being carried without dissent.

REPORT OF COUNCIL.

The Council considered correspondence as follows:—

1. An acknowledgement from the Hon. Secretary of the Association's subscription to the Garnett Memorial Fund.

2. A letter from the N.V.M.A. enclosing a copy of the scale of minimum fees under the Tuberculosis Order, 1925. The scale was for private circulation, and the Council felt that it was unnecessary to take any action at the moment.

3. In view of the application from the inspectors having been rejected, the Council had given careful consideration to the scale of fees paid by the North Riding County Council, and it advised the inspectors to hold a special meeting to consider any further action they might think desirable.

Arrangements for Annual Meeting.—The Council recommended that the annual meeting be held in Newcastle, on Saturday, 27th February, 1926, that there be a luncheon, and that members be invited to bring forward for discussion cases and pathological specimens.

The report was received and adopted.

Mr. Thompson referred to the North Riding Inspectors' fees, saying the amounts allowed were totally inadequate for the services rendered, and expressed the hope that any action by them would receive the support of the members.

The President explained that while the Council felt that the question was one entirely between the inspectors and the local authority, he was sure that they could rely on the support of every member of the Association.

Mr. ELPHICK suggested that the scale of professional charges adopted in 1920 should be reprinted and circulated to members. It was agreed that the Council should first scrutinise the scale.

Mr. T. DALLING then delivered his address on "Veterinary Biological Products, their Standardisation and Application." [This paper, by Messrs. T. Dalling, M.R.C.V.S., H. R. Allen, M.R.C.V.S., and J. H. Mason, M.R.C.V.S., appears at the commencement of this issue, together with the discussion which followed.—Ed.].

The PRESIDENT proposed a hearty vote of thanks to Mr. Dalling for his address, and to Messrs. Broad-

head and Sargeant for their kindness in working the lantern.

The proposal was seconded by Mr. DAVIDSON, and carried with acclamation.

A vote of thanks to the President terminated the proceedings.

J. R. RIDER,
Hon. Secretary.

The North of Ireland Division.

MEETING AT BELFAST.

A meeting of the above Division was held in the Pathological Laboratory Lecture Room, Queen's University, Belfast (by kind permission of Professor Symmers, Dean of the Faculty of Medicine) on Tuesday, 24th November, 1925.

The chair was taken by the President, Mr. J. Ewing Johnston, and the following members were also present: Messrs. F. W. Emery, S. R. Thompson, F. Lindsay, W. S. Lamont, H. McConnell, H. C. I. Kelly, W. Smith, A. P. Logan, F. W. Hart, W.G. Jones, Capt. T. Finch, Major D. R. Williamson, S. Hunter, R. W. Cassells, J. McLean, A. McLean, and J. I. Magowan, together with Messrs. H. L. McConnell and H. G. Lamont, Hon. Secretaries.

Visitors:—Messrs. J. J. Shankey and T. Smith.

Apologies for non-attendance were received from the following: Messrs. J. Loughran, St. J. C. P. Mac Farlan and Capt. J. P. Rice.

The members present spent the first hour examining numerous slides and specimens prepared in the Veterinary Laboratory, Imperial Secretary's Department. These were on view by kind permission of Mr. Emery, C.V.O.

At 8 p.m. the President took the chair, and called on the Secretary to read the minutes of the previous meeting, which were approved and signed. Arising out of the previous minutes, Mr. McConnell inquired if any reply had been received from Mr. Jewell with reference to his resignation. The Secretary intimated that no reply had been received.

It was proposed by Mr. McCONNELL and seconded by Mr. KELLY that the Secretary again write to Mr. Jewell.

CORRESPONDENCE. A letter from Mr. Bullock, Hon. Secretary, Garnett Memorial Fund, was read, and the President requested members to support this most praiseworthy fund. The Secretary and Treasurer agreed to forward subscriptions from any members desirous of subscribing.

A letter from Professor J. B. Buxton, with reference to the official chain of office, was read. It was proposed by Mr. W. S. LAMONT, seconded by Mr. J. McLean, and agreed that the sum of £2 be subscribed towards the North of Ireland Division's link.

Correspondence was read relative to the Victoria Veterinary Benevolent Fund, and a "whip round" resulted in £2 4s. being raised for this fund.

Copies of a scale of fees in connection with the Tuberculosis Order, 1925 were received from the "National" and circulated among the members.

The President then opened a discussion *re* veterinary fees at shows. He censured certain members for failing to carry out the terms of a resolution passed at a previous meeting. Several members stated that they were unaware of this resolution, and had acted in ignorance.

Mr. W. S. LAMONT proposed that the resolution in question should be rescinded and said that, in his opinion, it should be left to individual members to decide whether or not they should accept a fee. He thought that the resolution would help to kill small shows. He was not against members getting fees, but certainly thought that it should be left to their own discretion.

Mr. H. McCONNELL dissented, and *inter alia* said that he was in favour of veterinary surgeons attending shows and getting, if possible, £5 5s. for their services. Further, he did not approve of passing a resolution at one meeting and then changing it within a short period.

Mr. A. McLEAN said that he was one of the members referred to by the President; he had neither excuse nor apology to offer, nor did he desire to do so. It was common knowledge that other members acted in an honorary capacity at shows, and he was not going to be an exception.

The PRESIDENT strenuously opposed the view taken by the last speaker.

Major WILLIAMSON suggested that the original resolution be left standing, and members who so desired could return their fees to the show committees.

Mr. W. S. LAMONT considered rescinding the motion a much more practicable plan.

Mr. H. C. I. KELLY deplored the lack of principle involved and said he had acted under a misapprehension.

The SECRETARY read a notice from the National Veterinary Medical Association Council stating that, owing to the diversity of opinion in the matter, they declined to take any action in reference to this resolution, which was originally suggested by the Western Counties' Division.

The President was asked for his opinion by the Secretary and, in reply, stated that it was a matter of indifference to him, but if the resolution was left on the books he thought members should act honorably by it.

The resolution was put to the meeting, when the motion to rescind the previous resolution was carried by eight votes to seven. Several members did not vote.

New Members: The following new members were proposed, ballotted for, and elected: Messrs. W. G. Clarke, Mr. J. E. Johnston, junr., Belfast, and Mr. J. I. Magowan, Mountmorris.

INTERESTING CASES.

The President then called on Mr. KELLY to give an account of a case of rancid odour in milk, and a case of cystic ovaries in a cow, a fine specimen of which organs Mr. Kelly had forwarded for preservation, and was now on view.

XUM

Speaking to the first case, Mr. KELLY said that this cow was completing her fourth month of pregnancy before anything untoward happened, when the owner remarked that the milk had a peculiar, unpleasant odour. This odour persisted, and Mr. Kelly was consulted. To eliminate the possibility that some organism present in the water used for cleansing the milk utensils might be the cause of the condition, Mr. Kelly personally collected some of the milk in a sterilised vessel. After this milk had stood in the vessel from ten to twenty minutes, the peculiar rancid odour was distinctly noted. Some milk from each quarter was collected in sterilised tubes and forwarded to the Veterinary Laboratory, Imperial Secretary's Department, for bacteriological examination. The Report from the laboratory showed that the milk samples were sterile ; it was also remarked that, probably owing to the small quantity of milk forwarded, no rancid odour was observed. In these samples the milk was watery in character, with a very poor cream content, the normal stiff condition of the cream after centrifuging being absent. Towards the end of the fifth month of pregnancy, the cow was again examined and was found to have gone practically dry, only about 3 ozs. of secretion being obtained. It appeared that she had steadily gone dry since the rancid odour was first noticed. No organisms likely to cause the condition were recovered from this secretion, which was watery in nature with one or two small curds or floccules present. No rancid odour was observed from it, and it was more or less consistent with what one would expect from a cow approaching the termination of lactation.

DISCUSSION.

Mr. J. MCLEAN said it was not uncommon for milk to acquire a rancid odour towards the termination of lactation.

Mr. JOHNSTON had also been consulted different times about a similar condition, and agreed with Mr. McLean's remark.

Mr. W. S. LAMONT had seen similar cases, and had also recently been consulted about a cow whose milk could not be used for churning purposes owing to the fact that it gave the butter a rancid odour. The milk otherwise appeared normal.

Mr. H. G. LAMONT remarked that Mr. Kelly, in his investigation, had ruled out bacteria as a cause. Absorption of odours from the surrounding atmosphere had also been eliminated. Other cows had been fed on similar rations without producing the condition, so that they had been forced to conclude that the condition was due to pathological changes occurring in the udder secretory cells consequent on the approaching termination of lactation, these cells permitting the escape of lower fatty acids into the udder secretion in an unneutralised form, and that the odour was due to these acids.

Mr. MAGOWAN inquired if Mr. Lamont had tested for the presence of lower fatty acids. Mr. LAMONT said that unfortunately the quantity of milk supplied was too small to be of any service, but that a rancid odour was a fairly reliable guide as to the presence of these acids. The point that struck him was the early onset of the termination of lactation.

Mr. KELLY prefaced his second case with the remark that he brought it forward purely as a matter of interest.

History.—The cow, about six or seven years old, was due to calve on 4th June, 1925. The owner believed, from all outward appearances, that she was pregnant, but the animal came in season about the date she was due to calve. She was served by the bull again, but proved sterile and became a " buller," being in season almost every day. The calf bones, so called, became sunken. On the 29th night of September she was jumping on a heifer and it was surmised that she had fallen on the external angle of the ilium as, on the 30th September, she was unable to rise. Mr. Kelly diagnosed fractured pelvis and advised slaughter. On learning the history of the case Mr. Kelly suspected ovarian trouble—possibly cystic ovaries—and consequently made a *post-mortem* examination, when his suspicion of cystic ovary was confirmed. Endometritis was also present. The members present thanked Mr. Kelly for bringing forward the splendid specimen and excellent history supplied.

Mr. H. G. LAMONT described a case of osteoporosis occurring in a goat, as follows :—

Osteoporosis, Osteomalacia or Ostitis Fibrosa.

This disease has also been called " big head " and in the pig it has been termed osseous cachexia or " snuffles." The case occurred in an almost pure-bred Anglo-Nubian female goat, about one year old.

The goat was about fifteen weeks pregnant when symptoms were first noticed. Early in March, 1925, the first thing observed was that the goat began to lose her usual vivacity. Being more or less of a pet and often at liberty, she was accustomed to skip up and down on stools and forms which were about the owner's premises. It was remarked that she seemed to be getting stiff in her hind quarters and had apparently lost interest in acrobatics. She was still taking her food perfectly well and was on her usual diet. Towards the end of March, her appetite became fickle and she seemed disinclined to move about. It was now noticed that there was slight diarrhœa and that the goat was working her jaws in a peculiar manner, not dissimilar to the movements in chewing the cud. At this time, her jaws, especially the lower, appeared larger than normal and this enlargement was most marked at the angle of the rami, the enlargement being symmetrical on both sides. There was no evidence of pain in the part. The jaw bones were softer than normal and the anterior part of the mandible could be moved independently of the posterior. The teeth, especially the incisors, were very loose in the lower jaw. The goat was becoming very unwilling to rise and when she did attempt to walk was noticeably stiff in her hind legs, the action being stilted. There was a tendency for the animal to become pot-bellied. The jaws continued to enlarge and there was increased difficulty in feeding ; finally,

the mouth remained open all the time, with the tongue protruding slightly; consequently the mouth got very dry. There was no evidence of tenderness anywhere in the muscular or skeletal systems. The diarrhœa was now watery in character. On the 15th April she seemed to be in pain, and as there was prolapse of the vagina, she was shot. The owner, a doctor, made a *post-mortem* and forwarded me portions of the jaw, which I present for your examination. The owner informed me that the upper jaw and nasal bones were enlarged and soft. The bones of the pelvis and hind limbs also appeared softer than normal. He was of the opinion that the stomachs were very large and that labour had evidently been in progress. A male kid was discovered being expelled from the uterus and apparently normally developed for its age. As regards her diet, during last summer and autumn she grazed in a field which undergoes the usual rotation of crops. On dry days through the winter she ran loose and her diet consisted of Indian meal, crushed oats, clarendo, linseed cake and hay. As a kid she was allowed to suck her dam for the usual period. The mother is quite normal and has since reared healthy kids.

The portions of the jaw which I have here are quite soft and cartilage-like in consistency; they are easily bent and can be cut with a knife. Apparently the lime salts which give to bones their rigidity have been removed in some manner. As a matter of interest, sections of this cartilage-like tissue were prepared and examined; the lime salts have almost entirely disappeared from the bony trabeculæ and evidence of true bone is to be noted only at the centre of a few of them. The Haversian canals and narrow spaces are also enlarged and filled by a vascular fibrous tissue in which there is no evidence of calcification. Probably the bone removed has been absorbed by the action of the osteoclast cells. To summarise—There is a decalcification of existing bone and a formation of fibrous or osteoid tissue, which does not become calcified. It is not known what is the cause of this condition, but several theories are put forward.

(1) It has been attributed to some organism or virus not yet identified. Mossu has set up the disease in swine by transferring healthy swine to infected styes.

(2) Want of lime salts in the food has been suggested, or that the ratio of lime to phosphoric acid is too low—on the Continent it has been termed miller's or bran disease.

(3) Adrenal, parathyroid or pituitary insufficiency has been put forward as a possible factor. Other possible factors are bad hygiene and lack of vitamins. Possibly it may be shown that this disease is due to a filterable virus, somewhat similar in character to the virus described as being the cause of sarcoma. This virus, while being the direct cause of sarcoma, does not of itself produce the disease, other factors being required—such as certain forms of irritation; these apparently render the animal tissues suitable for the action of the infective agent. A combination of theories Nos. 1 and 2 may prove correct, *viz.*, infective agent *plus* excess of phosphoric acid and deficiency of lime salts in the food. Derangement of the endocrine glands may also assist. Calcium lactate, cod liver oil, green food and exercise, in combination with a change of locality, constitute the most hopeful treatment.

Mr. JOHNSTON said he had, on different occasions, been consulted about this disease. He had endeavoured to keep goats himself but the last five he had each developed osteomalacia, so that finally he had to stop keeping these animals.

Mr. J. MCLEAN remarked that he had seen several cases in goats kept about stables. He agreed with Mr. Johnston that nothing could be done with this disease, as no successful treatment had yet been devised.

The PRESIDENT then called on Major WILLIAMSON, who gave an account of some very interesting cases of "Bovine Enteritis of Doubtful Etiology." Major Williamson said:—

In bringing these cases before you I am doing so in the hope that I may obtain some enlightenment on their causation. There may be a simple explanation, but I frankly confess that I have not been yet able to discover any cause common to all and yet they all show some identical symptoms. The first case to which I desire to direct your attention is that of a pedigree shorthorn calf three weeks old, purchased at a September sale with its dam. The calf walked about seven miles to a farm, was kept there for a few days and then walked a further six miles to its new home. Three days after its arrival there I was called in. I found the temperature 105°F., pulse 90, membranes injected and pain on palpation of the abdomen, especially on the right side; there was slight diarrhœa and straining. I applied mustard to the abdomen, to be washed off in an hour and repeated two hours later. I directed the administration of five ounces of castor oil with one drachm of chlorodyne and ten minims carbolic acid, every six hours. Next day the temperature was 104·2°F., pulse 50, membranes still injected. It was impossible to form an estimate of pain in the abdomen, owing to the soreness of the skin. I ordered the application of warm, dry rugs and continued the medicine. On the following day, temperature was 103°F., pulse 60. The animal was looking for food and I allowed it to suck its dam, but warned the owner of the danger of its taking too much. I continued the oil and chlorodyne, without the carbolic acid, for three days and the animal made a complete recovery.

(2) The *subject* was a six quarter heifer, purchased the previous day, apparently healthy. Turned out next morning it looked ill and wandered about in a stupid manner and died a few hours later. I was called in to make a *post-mortem* examination. The whole of the intestine showed evidence of inflammation, being discoloured throughout its length and practically empty, except for gas and a small quantity of tarry blood-stained fluid. There was no evidence of anthrax. The stomach was full of food.

(3) *Subject.*—A two-year-old bullock in good condition, purchased a few days previously at a neighbour's house in the month of September. The owner sent for medicine to stop scour and in the evening I was called out to see the animal. I found him lying

XUM

on the left side; temperature 103·5°F., pulse fast and small, membranes injected. There was some evidence of pain in the abdomen and a little tarry excreta adhering to the anus; straining and looking round at the flanks. The owner informed me that the animal seemed to have lost control of his limbs as he had staggered and fallen several times prior to my arrival. I tried to get him up to observe this, but failed. I prescribed castor oil, chlorodyne, carbolic acid and ipecacuanha, and directed the application of hot fomentations to the abdomen. He died about 6 a.m. I did not get the opportunity of making a *post-mortem* examination.

(4) *Subject*: A two-year-old bullock which had been in the owner's possession for three months, but had been changed to different grass a week previously, in the month of September. The grass was old, but I was informed that it had been eaten close in the Spring, and was a new growth. The message I received was to come and see a bullock which was "astray in the head." I found him in a loose box, to all appearances perfectly healthy, but about every ten minutes or so violent straining set in, and he would then walk aimlessly round the box, and would walk over anything in his way. He could apparently distinguish light and darkness, but not objects. There was no sign of diarrhœa, and I was told there had been none, also that he had been very violent when in the field. I was inclined to discredit this and believe that it was the difficulty in seeing which made him run about aimlessly when they endeavoured to drive him in. I could find no symptoms of lead poisoning. My impression was that he was constipated and his stomach overloaded, giving rise to a form of staggers. I gave him a full dose of mag. sulph. to be followed by barium chloride 30 gr., antim. tart. 30 gr., and nucis vom. 1 drachm, to be repeated every three hours. On my arrival next morning he was dead. On *post-mortem* the intestines showed evidence of inflammation throughout their length; from the peritoneal surface they were of a deep purple colour. There was no evidence of ulceration or desquamation, the intestine contained a small quantity of a thick, tarry-looking matter. The stomachs were full of ingesta; in the second stomach I found quite a number of small seeds—about a pint; these were the pips of blackberries. On examining the rumen, I found quite a quantity of briar and blackberry leaves. Whether these or the seeds had anything to do with the condition I cannot say.

(5) *Subject*: A two-year-old bullock, put up for stall feeding a fortnight before in the end of October; seemed out of sorts in the morning, was given a pint of castor oil and half a glass of spts. æth. nit. I saw him at night. Temperature 103° F., pulse 60, extremities cold, slight evidence of pain in the abdomen and slight tympany of the rumen, diarrhœa of normal colour, and slight straining after defæcation. I applied mustard to the abdomen and directed its repetition every three hours, administered chlorodyne 4 dr., tr. opium 2 dr., Jeyes' fluid 1 dr., in a pint of water and left another dose to be given in six hours if the pain continued. Next morning the temperature was 102·5° F., pulse 50, extremities warmer, fæces normal, and very little straining. I put him on bismuth, soda bicarb., nux vomica, and gentian. He made an uneventful recovery.

(6) *Subject*: A bullock purchased in October and in owner's possession three weeks. He walked twelve miles from the fair. He was noticed ill at night and was given a pint of castor oil, and half a glass of spts. æther nit. I was called in next morning, and found the temperature 105° F., pulse scarcely perceptible, extremities cold, eye sunken, violent straining, animal evidently *in extremis*. I attempted to administer medicine, but he would not swallow. He died a few hours later.

One thing that I think will strike you in all these cases is that they all occurred in the months of September and October, and also that all the animals had been subject to a change either from one farm to another, or from one style of feeding to another. I do not know that this of itself would cause the disease I have described, but it might well be a predisposing factor in either deranging the alimentary canal or lowering its resistance, so that the bacteria of the intestine became pathogenic.

An extremely interesting discussion followed, in which the following members took part: Messrs. F. W. Hart, W. S. Lamont, A. P. Logan, H. G. Lamont, H. McConnell, H. C. I. Kelly, and A. McLean.

The members present thanked Major Williamson for his very interesting paper on cases so commonly met with in general practice.

The PRESIDENT raised the subjects, "Injuries to Irish Cattle in Transit," and "The Dangerous Condition of the Roads for Horse-drawn Traffic."

Mr. MCLEAN thought that Irish cattle received the injuries referred to after they left Ireland.

Mr. W. S. LAMONT was of opinion that the major portion of the injuries was inflicted at the small country fairs and stated that he had often to draw the attention of the R.S.P.C.A. Inspector to the cruel treatment of the animals.

Mr. H. MCCONNELL agreed with the previous speaker in regard to these fairs.

An animated discussion in regard to the state of the roads followed. It was unanimously decided that the Hon. Secretary draft a resolution and forward it to the proper authorities in regard to this matter.

Mr. H. C. I. KELLY proposed, and Mr. W. S. LAMONT seconded, that Mr. H. L. McConnell be appointed Joint Hon. Secretary with Mr. H. G. Lamont. This was passed unanimously. The PRESIDENT congratulated the Hon. Secretaries on the splendid array of specimens and slides which were on view and moved that a vote of thanks be passed to them for the excellent and instructive meeting which they had arranged.

Major WILLIAMSON seconded.

Votes of thanks to Professor Symmers for providing the lecture room and to Mr. Emery for the use of the interesting specimens and slides were passed unanimously.

H. G. LAMONT,
H. L. MCCONNELL,
Hon. Secretaries.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

February 4th.—Meeting of the Central Division at 10 Red Lion Square, W.C.1.
,, 9th.—Meeting of the Lancashire Division, at Manchester.
March 12th.—Annual Meeting and Dinner of the Lancashire Division at Manchester.
March 31st—Garnett Memorial Fund—Closing Days.
April 1st—R.C.V.S. Annual Fee of £1 1s. 0d. due.
,, 8th—R.C.V.S. Committee Meeting.
,, 9th—R.C.V.S. Committee Meeting ; Council Meeting 2 p.m. ; Garnett Memorial Fund Committee Meeting.
June 30th—R.C.V.S. Annual Dinner, Hotel Victoria, London.

Royal College of Veterinary Surgeons.

COUNCIL ELECTION, 1926.

We have been requested to publish the following revised list of names of those gentlemen who have been nominated for election to Council R.C.V.S. :—

Name and Address.	*Proposers.*
ABSON, JOSEPH Sheffield.	J. M'Fadyean. O. Charnock Bradley.
BRITTLEBANK, JOSEPH WILLIAM Manchester.	G. H. Locke. Trevor F. Spencer.
COLEMAN, JOHN CHAS. Swindon.	Sydney H. Slocock. Joseph H. Carter.
HUGHES, RICHARD Oswestry.	John T. Allen. John Spruell.
LIVESEY, GEOFFREY H. Blackheath, S.E.	J. M'Fadyean. John W. McIntosh.
MOORE, SIR JOHN Hampstead, N.W.3.	J. M'Fadyean. Stewart Stockman.
SUMNER, HENRY Liverpool.	John T. Allen. John Spruell.
WEST, ERNEST ALFRED London.	J. Clarkson. A. Gofton.
WHITEHOUSE, ARTHUR WILDMAN Glasgow.	John R. McCall. William Robb.

FOOT-AND-MOUTH DISEASE.

"The Ministry of Agriculture, in their week-end report on foot-and-mouth disease, record the confirmation of the outbreak at Marske-by-the-Sea, in the North Riding of Yorkshire," says *The Times* of January 19th.

"The cattle infected were purchased at Northallerton Market on January 6th, and the owner sold four cattle and eight sheep at Guisborough Market on January 12th. Efforts to trace these animals are now in progress. In connection with this outbreak the slaughter of 60 cattle, 146 sheep, and two pigs has been authorised by the Ministry.

"The outbreak has necessitated the extension of an existing scheduled area to embrace the whole of the North Riding, Durham, and the boroughs of Newcastle-on-Tyne, Wallsend, and Tynemouth. There are now altogether nine scheduled areas in the country, as follows:—Lancashire, Staffordshire, Gloucester, Wiltshire (two), Southampton, Essex, Lincolnshire, and Yorkshire (North Riding). Since the present epidemic began on September 25th last, there have been slaughtered 7,863 cattle, 8,256 sheep, 2,409 pigs, and 31 goats. The estimated amount of compensation payable is £244,000."

"The Vulgarism 'Vet.'"

"I have a good deal of sympathy," writes Mr. A. Croxton Smith, in the *Daily Telegraph*, of January 1st, "with the protest made by the 'Veterinary Record' against the use of the word 'vet.' in lay articles dealing with a member of the veterinary profession. It is a vulgarism comparable with 'doc.' as applied to a medical practitioner. Dog-owners owe much to veterinary surgeons, many of whom have taken great pains to master the peculiar diseases to which our canine friends are susceptible. In the majority of cases when veterinary surgeons are called in, the sympathy and consideration shown extend far beyond the professional requirements. Being usually dog-lovers themselves, they take a friendly interest in the patients, recognising that the relationships existing between dogs and mankind are on a different footing from that of other animals. What is more, they are as solicitous for the recovery of the family pet of little pecuniary value as they are for the welfare of the show champion worth some hundreds of pounds, realising that when sentiment enters into the matter money is not the main thing that counts.

"Long before the remarkable growth of dog-breeding made this branch of animal economy worthy of specialist study from a professional point of view, leading veterinary surgeons in the United Kingdom and elsewhere had devoted considerable time to the investigation of diseases of the dog. The first that come to my mind are Blaine and Youatt, followed in more recent times by the late Mr. Hunter, all of whom added materially to our knowledge and laid the foundation for the more scientific methods of the present day. Youatt, who had literary gifts beyond the common, was responsible for a general work on the dog to which many of us still turn with pleasure. There was a lot of common-sense in the practice of these pioneers of a century ago, and we are indebted to them for more than we understand. To-day a number of acute minds are engaged in research, the leaders of the profession by their contributions to veterinary literature freely giving the results of their experience for the benefit of "all."

A correspondent draws our attention to the fact that W. E. L. Taylor, B.V.Sc., M.R.C.V.S.—at present holding a scholarship at the Ministry of Agriculture Laboratories, New Haw, Weybridge—won First Prize of £10 10s., defeating 14,999 entrants, for the Heath Robinson Broadcast Sketch. The prize was won in a broadcast competition open to the British Isles, for the best sketch on certain lines laid down by the famous artist. See, probably, the next issue of "The Radio Times."

It is hoped, says *Poultry*, that a Bill will be passed by the legislature affording owners of poultry the same protection as have those of cattle—that is, dog owners shall be responsible for any loss arising from their worrying or killing poultry.

XUM

Scope for the Veterinarian.

The signs that there is an apparent increase of disease among poultry flocks in different parts of the country, in some directions threatening to assume an epidemic form, emphasise the resolution adopted by the National Poultry Parliament at Harrogate that a conference on diseases shall be convened. The executive committee are considering the subject, and hope to make an announcement at an early date. One of the most difficult problems is that of dissemination of infected stock, whether privately or at auctions and markets. This question has on several occasions been before the Council. Up to the present time nothing has been determined, mainly by reason of the cost of inspection and the reluctance of many local authorities to undertake its reponsibility. Special attention was called at the last Council by Mr. Marcus Slade to the fact that local sanitary authorities have already power to take action in respect to cleanliness of pens and crates and exposure for sale of diseased birds. All cases of neglect in the former or illegal action in the latter should at once be reported to the sanitary authority, and it is suggested that poultry societies and private individuals should make it their business to see that the law, which appears to be adequate, is enforced by the local inspectors, and that whenever birds so diseased are sent by rail, the first step is to bring such cases under the notice of the local authorities.—*Poultry.*

We notice, with interest, that the Royal Warrant of Appointment to His Majesty the King, has now been granted to The Gray Horseshoe Pad Co., Suffolk Street, Birmingham, in respect of their Patent Horseshoe Pads.

To those conversant with such matters, it may be known that the Royal Warrant is only conferred after several years continuous service, in regard to an article of special merit, therefore we offer our congratulations to a Firm of enterprise, whose endeavours are to ameliorate the working conditions of horses on present day Slippery Roads.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Blood Pressure and its Application in Canine Practice.

(J. G. Horning and A. J. McKee in *Journal A. V.M. A.*, November, 1925).

To the Editor of the Veterinary Record.

Sir,—I have read with considerable interest the article by Messrs. Horning and McKee on blood pressure in your issue of January 9th.

The rise in pressure in accordance with body weight is noticeable and particularly its steepness up to 90lbs. In my own observations on horses, I find that in animals being trained, and as the density of the tissues becomes more pronounced, there is a similar rise. I have not, however, associated this with increase of weight, although there is usually some gain in the first stages of training.

The reference to puppies showing a higher blood pressure than adults is partly simulated in horses. Yearlings, soon after being put into training, show extraordinary high diastolic pressure as compared with three or four-year-olds. The blood pressure is low when they are first taken in hand, but as they become two-year-olds and begin to show fitness blood pressure increases—frequently to what appears a dangerous height.

There is a dearth of literature on the subject in animals, and it would be interesting to know if the authors, to whom reference is made above, have found any wide differences in diastolic blood pressure records of dogs before and after violent excretion, and whether these variations are modified or decreased when an animal, such as a greyhound, is said to be "fit." Also, as to whether they have fixed any point as a dangerous one, and what that danger would be in an apparently "fit" animal.

I understand the writers to mean that toxicity is caused from intestinal absorption and undoubtedly this is a potent factor in high blood pressure. Probably treatment by purgation removes the causal element and its action on the vaso-motor system, thus relieving the tension. It appears, however, to be a crude method, and one is given no information as to whether any of the hypotensive drugs would not have a similar effect in conjunction with an intestinal disinfectant. This would obviate the nausea and general malaise associated with an active purge. These points are of particular interest in the training of blood-stock, when, so often, "time is the essence of contract" and a purgative means a loss of probably a week.

The authors select the hind leg of a dog simply, I suppose, for convenience. The hind leg of a horse is inadvisable for obvious reasons. I apply the cuff to the foreleg and, of course, do not cast the horse. The cuff is a conception of my own for holding the rubber pressure bag, and the instrument is of the aneroid type made by Messrs. Bell and Croydon. By hanging the dial on a hook attached to the cuff, I am able to work the pump with my left hand and take the arterial pulse above the knee with my right, thereby checking both systolic and diastolic readings. One attendant at the horse's head is enough, and occasionally I do it alone. The quieter one is, the better, as excitement is detrimental to correct reading.—I am, yours truly, F. S. H. Baldrey, Lieut.-Col., C.M.G., F.R.C.V.S., D.V.H., Lambourn.

Official Veterinary History of the Great War.

To the Editor of The Veterinary Record.

Sir,—In the notice I wrote of the events in Mesopotamia, I stated that I was ignorant of the name of the officer who introduced the treatment of equine piroplasmosis by the intravenous injection of quinine.

I have now heard from Lieut.-Col. A. J. Williams, who is in India, and he has been good enough to send me a copy of an Official Report he wrote on the subject, which was printed and issued by the military authorities in India, in 1914.

In this report it is stated that the initiation of the treatment was due to Colonel (now Major-General) E. R. C. Butler.

To Major Williams, as he then was, fell the responsible work of carrying out the necessary experiments and observations, and bringing matters to a successful issue.

I feel sure that I am only anticipating the cordial approval of General Butler (who is also absent from this country) in linking the name of Lieut.-Col. A. J. Williams with his, in connection with this remarkably successful method of treatment.—Yours faithfully, F. Smith.

The Editor acknowledges the receipt of the following:—

Report of a meeting of the Lancashire Division from Mr. J. Spruell, Hon. Secretary.

Report of a meeting of the Veterinary Medical Association of Ireland, from Professor J. J. O'Connor, Hon. Secretary.

Communications from Mr. W. E. Blackwell, Miss A. Cust, Mr. H. H. Curson, Lieut.-Col. T. D. Young, and Mr. Carter Armstrong.

National Veterinary Medical Association of Great Britain and Ireland.

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All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, "Veterinary Record," 10 Gray's Inn Square, W.C.1